

(a) ligation of ssDNA

GATCAGGT^S (SEQ ID NO: 12)
 +
 CTAGTCCAAAGT GCT CGG
 (SEQ ID NO: 13)

GATCAGGT TT CACGAGCCTG
 (SEQ ID NO: 14)

ligation of duplex DNA

(SEQ ID NO: 15)
 T T G T A C G C T G G A T G C A
 T T C A T G C G A C C T + T C C A G C G T A C T
 -S- A C G T A G G T C G C A T G T
 (SEQ ID NO: 15)

T T G T A C G C T G G A T G C A T C C A G C G T A C T
 T T C A T G C G A C C T A C G T A G G T C G C A T G T
 (SEQ ID NO: 16)

one pot ligation / cyclization of ssDNA

(SEQ ID NO: 17)
 G T T T T A T A C A A A A C C T G G C A
 T C A G C A A A A T A T G T S- T T T G G A C C G T T G G T
 (SEQ ID NO: 18) C + T (SEQ ID NO: 19)
 T C T G C T T C A C T A G T, T C A G G A G A C T G T T C A G
 A G T G A T C A A G T C C T C T G A
 (SEQ ID NO: 20)
 ↓
 T C A G C A A A A T A T G T T T G G A C C G T T G G T
 (SEQ ID NO: 21) C
 T C T G C T T C A C T A G T, T C A G G A G A C T G T T C A G

(b)

rxn. type	conversion	isolated yield
ssDNA ligation	>90%	44%
duplex ligation	75%	36%
ligation/cyclization	>90% (1st step) 50% (2nd step)	20%

Fig. 4

exonuclease / hydrolysis susceptibility

5'-GATCAGGT_pTTCACGAGCCTG-3' (SEQ ID NO:14)

endonuclease susceptibility

T^TGTACGCTGGA TGCA_pTCCAGCGTACT^T
T^TCATGCGACCT_pACGT AGG TCGCATG_T (SEQ ID NO:16)

template for replication / transcription

(SEQ ID NO:22)

5'-TAATAACGACTCACTATA

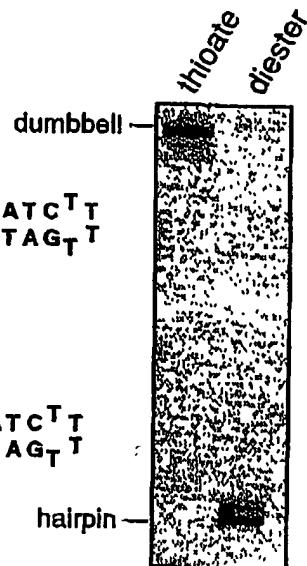
3'-ATTATGCTGAGTGATATCCTGCCTATTCCGAGCACTT_pTGGACTAG
(SEQ ID NO:23)

Fig. 5



5' bridging phosphorothioate duplex:

(SEQ ID NO: 24) $\begin{array}{l} \text{T} \text{TGTACGCTGGATGCA}^{\text{S}} \text{CCAGCGTATCTT} \\ \text{T} \text{TCATGCGACCT}^{\text{S}} \text{ACGT AGGTCGCATAGT} \end{array}$



all phosphodiester duplex:

(SEQ ID NO: 25) $\begin{array}{l} \text{T} \text{TGTACGCTGGATGCATCCAGCGTATCTT} \\ \text{T} \text{TCATGCGACCT}^{\text{S}} \text{ACGT AGGTCGCATAGT} \end{array}$

Fig. 7

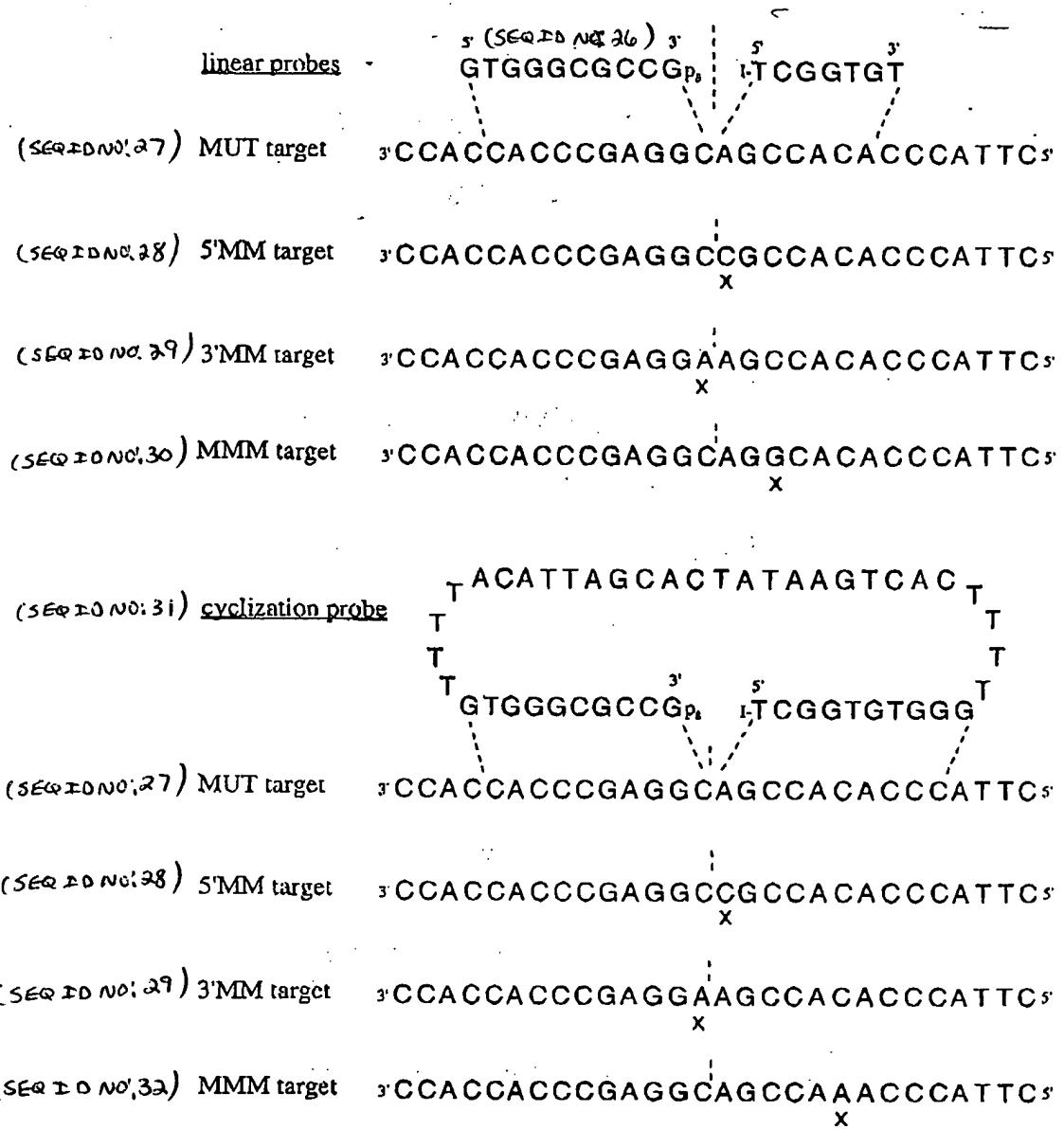


Fig. 8

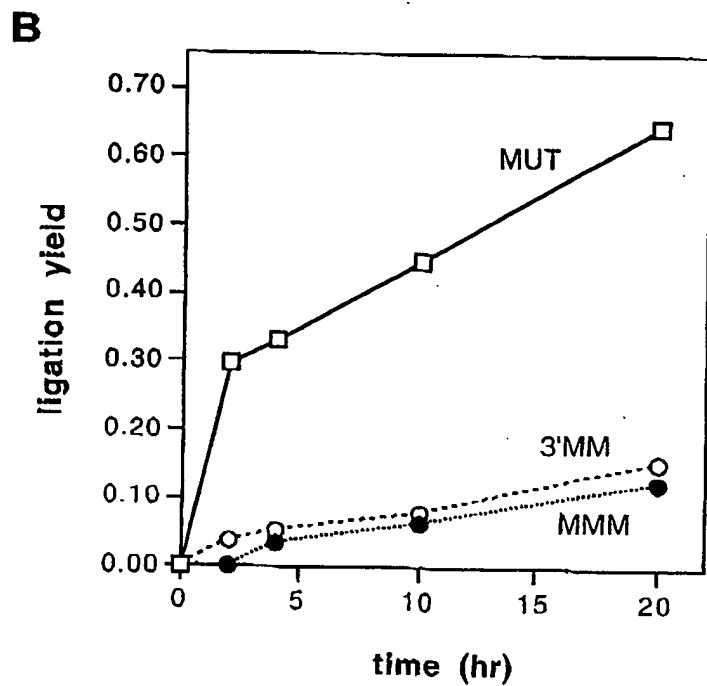
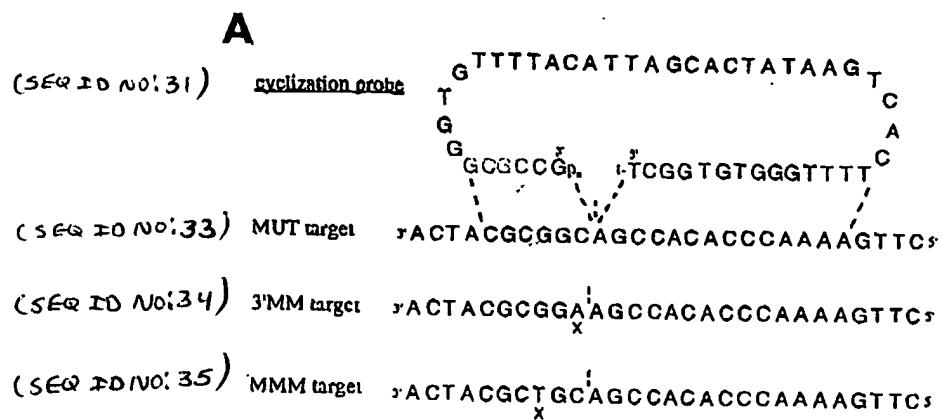


Fig. 11

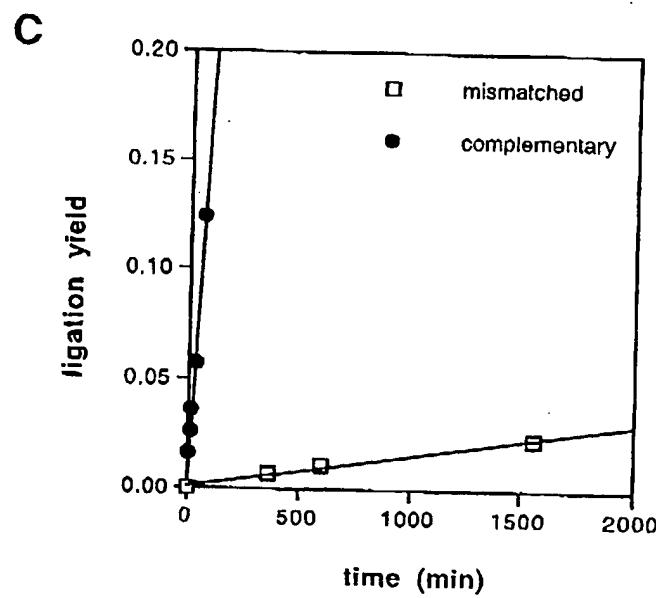
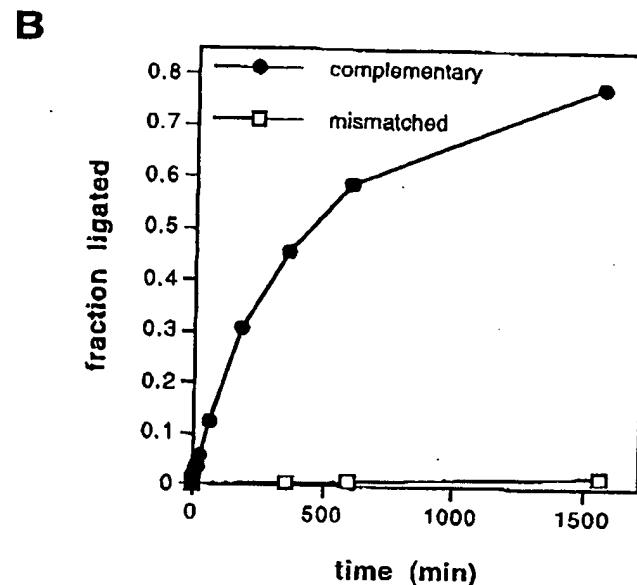
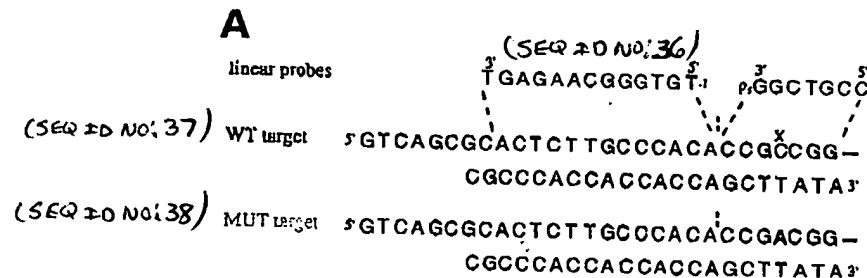


Fig. 12



Fig. 13

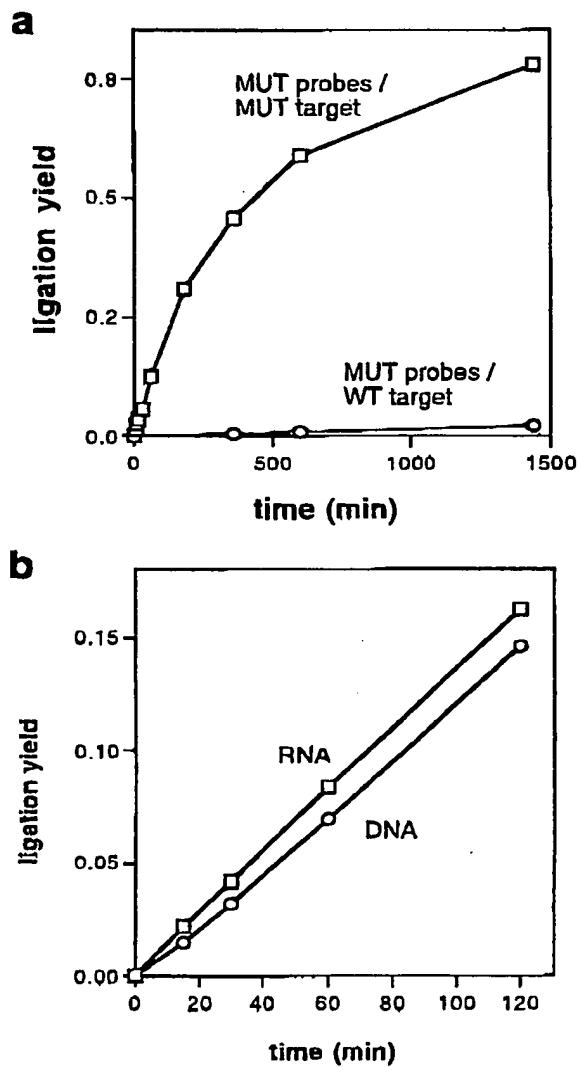


Fig. 14

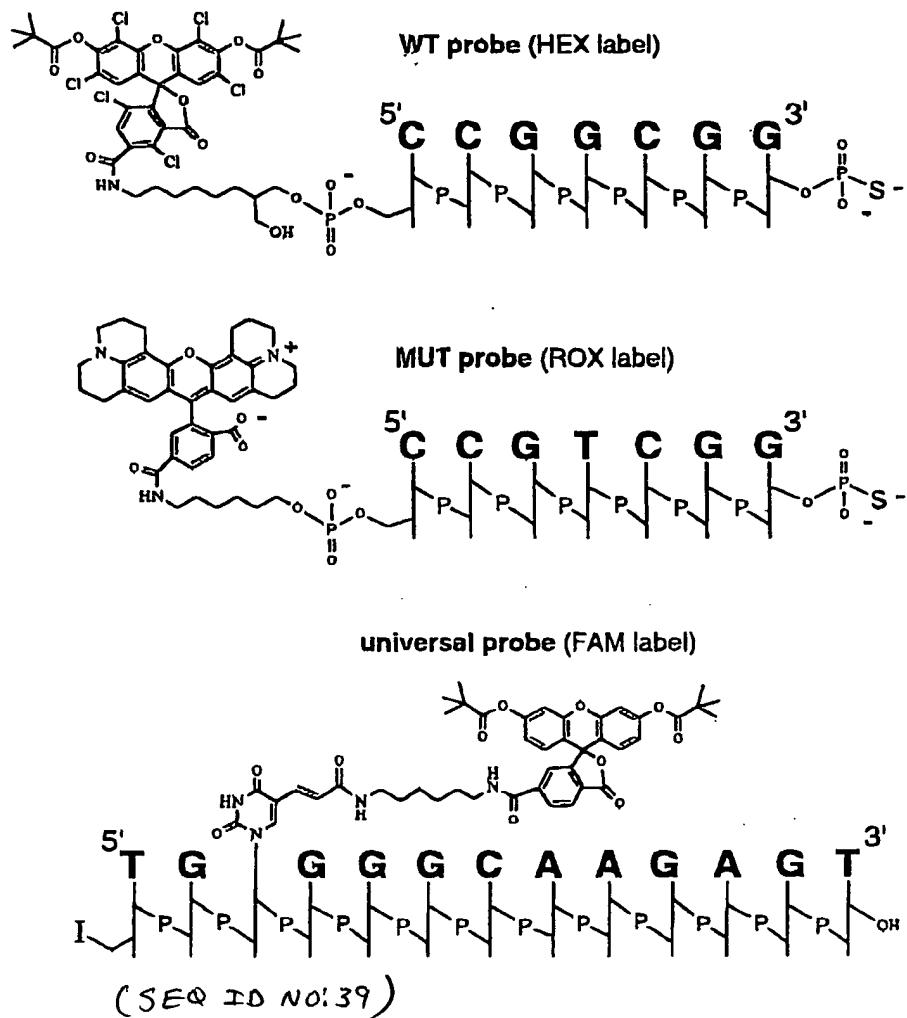


Fig. 17

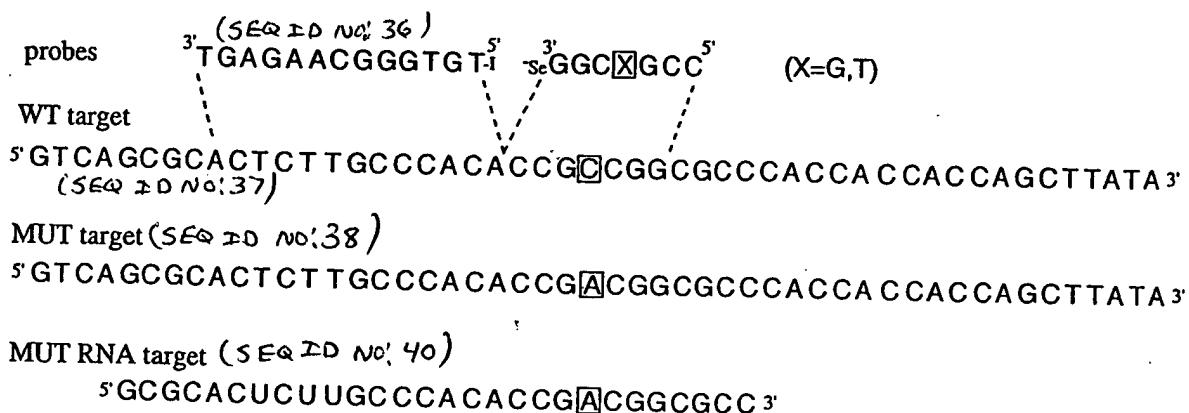


Fig. 19

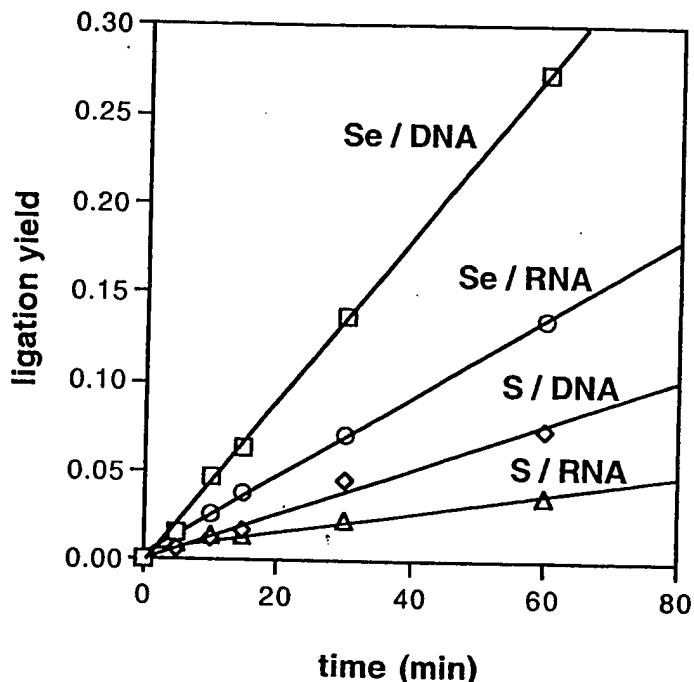


Fig. 20